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09/511,158	02/23/2000	Hidekazu Nakamoto	500.36898VX1	4119

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EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/511,158

Applicant(s)

NAKAMOTO ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment submitted on May 1, 2006 has been received and carefully considered. Claims 1-15 are cancelled. Claims 16-37 are newly added and under consideration.

### ***Claim Objections***

2. Claims 16 and 30 are objected to because,  
In claim 16, line 24: "bocks" should be changed to --blocks--.  
In claim 30, line 23: "bocks" should be changed to --blocks--.

Appropriate correction is required.

### ***Claim Rejections – 35 U.S.C. § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 16-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaefer et al. (US 4,100,142) in view of Schnock et al. (US 3,591,344) and Shaw et al. (EP 0 711 597).

Regarding claims 16 and 30, Schaefer et al. discloses a polyester manufacturing apparatus (Figure) comprising:

a first reactor (i.e., primary esterifier 6) reacting an aromatic dicarboxylic acid or its derivative (see column 8, lines 33-50) and a glycol (see column 8, lines 13-32) to produce a first product;

a second reactor (i.e., low polymerizer 18) in which the first product from reactor 6 is polycondensed to produce a second product of a low molecular weight polyester polymerized to a higher degree than said first product (see column 6, line 27 to column 7, line 12); and

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a third reactor (i.e., high polymerizer **23**) in which the second product from reactor **18** is further polycondensed to produce a high molecular weight polyester polymerized to a higher degree than the low molecular weight polyester, said third reactor **23** (see column 7, line 12 to column 8, line 12) comprising,

a substantially horizontal cylindrical vessel, an inlet **32** at one end of the vessel, an outlet **33,27** at another end of the vessel, and a stirring rotor (i.e., shaft **25** carrying a plurality of foraminous members **26**) which is provided and rotated in the vessel.

The members **26** comprise disks (e.g., "... screens, perforated discs, spoked wheels and the like," column 7, lines 47-53; column 17, lines 2-14), wherein each disk inherently defines a plate portion at least on its periphery portion, wherein the spacing between disks **26** is varied depending on location within the reactor **23** (and hence, the corresponding viscosity of the polyester at that location; see column 7, lines 39-46), and wherein the disks may be configured as different structures (e.g., in the form of variations in the void area; column 17, lines 2-8) depending on location within the reactor **23** (and hence, the corresponding viscosity of the polyester at that location). In addition, scraping vanes may be disposed on the periphery portion of the members **26** (i.e., "... wiping appendages may be attached," column 17, lines 19-21), to exert a polymer scraping or wiping action to avoid polymer build-up within the reactor.

Schaefer et al., however, is silent as to the stirring rotor specifically comprising the instantly claimed configuration (e.g., a stirring rotor with no shaft at the rotating center, disks connected by rods in parallel to the rotating center, stirring blocks, etc.)

Schnock et al. teaches a conventional stirring rotor having no shaft at a rotating center

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(see FIG. 1), the stirring rotor comprising a plurality of disks 4 positioned next to each other and connected to each other by rods (i.e., rod shaped members 3; column 3, lines 55-65) in parallel to the rotating center, with a hollow disposed at its center area (see FIG. 1), and scraping vanes (i.e., drag elements 2; column 3, lines 50-54) disposed on the periphery portion around the hollow, in the space between these disks 3.

Shaw teaches a stirring rotor comprising a plurality of stirring blocks depending on viscosities of a low molecular weight polyester being polycondensed (i.e., "... the spacing between each overflow baffle 56 and the next succeeding overflow baffle 56 essentially divides the overall chamber 30 within the vessel 22 into a series of generally distinct compartments in which the polymer is transiently contained as it flow through the chamber 30," see column 8, lines 3-21), wherein the stirring blocks have different structures of the disks or the vanes (see FIGs. 4A-4H for overflow baffles 56 and FIGs. 7A-7F for underflow baffles 58). Shaw further discusses the benefits of providing a stirring rotor having no shaft at a rotating center (see column 12, lines 24-46).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the stirring rotor in the apparatus of Schaefer et al. to comprise no shaft at the rotating center and to comprise disks connected by rods in parallel to the rotating center, on the basis of suitability for the intended use, because such configuration is conventional in the art, as evidenced by Schnock et al., and because such configuration minimizes the accumulation of polymer on a central shaft and the subsequent contamination of polymer within the reaction chamber, as identified by Shaw. In addition, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the stirring rotor in the apparatus

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of Schaefer et al. to comprise a plurality of stirring blocks, on the basis of suitability for the intended use, because the stirring blocks provide serial compartmentalized containment of the polymer, which "...enables the residence time of the polymer within each succeeding compartment to be relatively closely controlled, which in turn enables control of the overall distribution of the polymer along the length of the reaction chamber and a relatively close control of the viscosity growth in the polymer among the serial compartments," (column 8, lines 10-21), as taught by Shaw.

Regarding claims 17 and 31, Schaefer et al. further discloses that a film of the low molecular weight polyester is formed on the stirring rotor (see column 7, lines 39-46).

Regarding claim 18, as modified above, a number of the scraping vanes in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, will be smaller than the number of scraping vanes in a low viscosity side of the stirring blocks, where the inlet 32 is nearer, because the number of disks on the outlet side of the reactor is smaller than the number of disks on the inlet side, due to the larger spacing between disks on the outlet side relative to the inlet side of the reactor (see column 7, lines 39-46).

Regarding claim 19, Schaefer et al. further discloses that an area of the hollow of the disks 26 in a high viscosity side of the stirring blocks, wherein the outlet 33,27 is nearer, is larger than the area of the hollow of the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (see column 7, lines 39-46; column 16, line 55 to column 17, line 21; column 17, line 55 to column 18, line 2).

Regarding claim 20, as modified above, a number of the scraping vanes in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, will be smaller than the

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number of scraping vanes in a low viscosity side of the stirring blocks, where the inlet 32 is nearer, because the number of disks on the outlet side of the reactor is smaller than the number of disks on the inlet side, due to the larger spacing between disks on the outlet side relative to the inlet side of the reactor (see column 7, lines 39-46).

Regarding claim 21, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 22, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 23, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 24, as modified above, a number of the scraping vanes in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, will be smaller than the number of scraping vanes in a low viscosity side of the stirring blocks, where the inlet 32 is

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nearer, because the number of disks on the outlet side of the reactor is smaller than the number of disks on the inlet side, due to the larger spacing between disks on the outlet side relative to the inlet side of the reactor (see column 7, lines 39-46).

Regarding claim 25, Schaefer et al. further discloses that an area of the hollow of the disks 26 in a high viscosity side of the stirring blocks, wherein the outlet 33,27 is nearer, is larger than the area of the hollow of the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (see column 7, lines 39-46; column 16, line 55 to column 17, line 21; column 17, line 55 to column 18, line 2).

Regarding claim 26, as modified above, a number of the scraping vanes in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, will be smaller than the number of scraping vanes in a low viscosity side of the stirring blocks, where the inlet 32 is nearer, because the number of disks on the outlet side of the reactor is smaller than the number of disks on the inlet side, due to the larger spacing between disks on the outlet side relative to the inlet side of the reactor (see column 7, lines 39-46).

Regarding claim 27, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 28, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is



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nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 29, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 32, as modified above, a number of the scraping vanes in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, will be smaller than the number of scraping vanes in a low viscosity side of the stirring blocks, where the inlet 32 is nearer, because the number of disks on the outlet side of the reactor is smaller than the number of disks on the inlet side, due to the larger spacing between disks on the outlet side relative to the inlet side of the reactor (see column 7, lines 39-46).

Regarding claim 33, Schaefer et al. further discloses that an area of the hollow of the disks 26 in a high viscosity side of the stirring blocks, wherein the outlet 33,27 is nearer, is larger than the area of the hollow of the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (see column 7, lines 39-46; column 16, line 55 to column 17, line 21; column 17, line 55 to column 18, line 2).

Regarding claim 34, as modified above, a number of the scraping vanes in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, will be smaller than the number of scraping vanes in a low viscosity side of the stirring blocks, where the inlet 32 is nearer, because the number of disks on the outlet side of the reactor is smaller than the number of

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disks on the inlet side, due to the larger spacing between disks on the outlet side relative to the inlet side of the reactor (see column 7, lines 39-46).

Regarding claim 35, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 36, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

Regarding claim 37, Schaefer et al. further discloses that a space between the disks 26 in a high viscosity side of the stirring blocks, where the outlet 33,27 is nearer, is larger than the space between the disks 26 in a low viscosity side of the stirring blocks, where the inlet 32 is nearer (i.e., "... progressively longer distances between consecutive formaminous members from inlet to outlet," column 7, lines 39-46).

#### ***Response to Arguments***

4. Applicant's arguments submitted on May 1, 2006 have been fully considered, but they are moot in view of the new grounds of rejection, necessitated by amendment.

#### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this

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Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449.


The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer A. Leung  
July 24, 2006 

  
ALEXA DOROSHENK NECKEL  
PRIMARY EXAMINER